

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 3 of 14

U.S.C. § 112. Additionally, the claims also fully satisfy the requirements of 35 U.S.C. §§ 102 and 103. Specifically, the Examiner has indicated that claims 1, 2, 5-15 and 18-29 are pending in the application and are also rejected. By virtue of this Response, claims 5, 11 and 18 have been amended to more clearly and distinctly identify that which Applicant considers the invention; all other claims remain unamended. Additionally, Applicant has provided arguments refuting the Examiner's rejection of the claims under anticipation and obviousness below. Thus, the Applicant believes that all of these claims are now in allowable form.

Objections

In Section 1 of the Examiner's Detailed Action portion of the Final Office Action, it was indicated that in claim 5, line 1 and claim 18, line 1, the word "linkage" should be "link". Applicant has hereinabove amended claims 1 and 18 to properly identify the claimed component to read in accordance with the specification and as identified by the Examiner.

Additionally and though not the subject of a specific objection, claim 11 has been amended to correct minor inconsistencies in the claim language. Specifically and at line 14, where the element of a second extension arm being mounted, it is submitted that such arm is to be mounted to the second extension hub and not the first. Support for the amendment can be seen in at least Fig. 2C and the corresponding portion of the written specification; no new matter has been entered. Additionally, the phrases "first robot blades" and "second robot blades" have now been amended to properly read "first robot blade" and "second robot blade" (singular form) to be in conformity with the earlier introduction of these elements; no new matter has been entered. Further, it is submitted that neither of the amendments

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 4 of 14

have been made for the purposes of overcoming any alleged prior art.

Rejections

A. 35 U.S.C. § 102

The Examiner has rejected claims 1, 6, 7, 11-14, 19-21 and 24-29 as being anticipated by U.S. Patent No. 5,765,444 issued June 16, 1998 to Bacchi et al. (hereinafter Bacchi). The Examiner has also similarly rejected each of the above-identified claims as being clearly anticipated by U.S. Patent No. 6,155,768 issued December 5, 2000 to Bacchi et al. (hereinafter Bacchi 2). The rejections to the above-identified claims with respect to both Bacchi references is respectfully traversed.

Each of Bacchi and Bacchi 2 have been carefully reviewed so as to ascertain the specific construction of each invention disclosed by the subject references. As a result of such inspection, it is respectfully submitted that neither of these references particularly and distinctly read upon the independent claims. The specifics of which are brought forth as follows. Initially, it is offered that neither Bacchi or Bacchi 2 disclose the fourth and fifth elements of claim 1 (a first robot blade being mounted to a first robot extension arm and a second robot blade being mounted to a second robot extension arm). That is, one only need to inspect Figures 1A and 1B of Bacchi and the corresponding written portion of the specification describing such construction (e.g., column 5, lines 19-25) to ascertain that this particular reference shows an end effector hand 30R is mounted to an intermediate structure or forearm 22R. The forearm 22R is then mounted to an upper arm 14R. Similarly, the left hand portion of Bacchi shows a similar arrangement (i.e., hand 30L is mounted to forearm 22L which is mounted to upper arm 14L). Bacchi 2 shows a similar construction where an offset hand 30R is mounted to

Response under 37 C.F.R. § 1.116

Serial No. 09/765,830

Page 5 of 14

intermediate elbow 22R which is then mounted to upper arm 14R. A corresponding arrangement is also found on the left side of the robot arm structure of Bacchi 2. Therefore, it can be seen that the robot blade of either Bacchi or Bacchi 2 (hand 30R or 30L) is not mounted to a first robot extension arm, such as upper arm 14, but to an intermediate elbow 22R or 22L. "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim" (Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added). The Bacchi or Bacchi 2 references fail to disclose each and every element of the claimed invention, as arranged in the claim. Similarly, the second robot blade of either Bacchi or Bacchi 2 is also mounted in a three-link arrangement with the intermediate elbow 22R or L disposed between any conceivable hand and any conceivable first robot extension arm. Therefore, neither of the two references disclose mounting a robot blade to a first extension arm in either a first (right-handed) or second (left-handed) arrangement.

There is also no specific teaching or disclosure of the seventh and eighth elements of claim 1 (the first and second extension motors). Specifically, the first and second extension motors as claimed in the subject invention provide controllable, simultaneous extension or attraction of first/second extension arms and robot blades. This is clearly not taught, disclosed or suggested in either Bacchi or Bacchi 2. In fact, there is an explicit teaching that shows that a single motor of Bacchi or Bacchi 2 does not provide the claimed control conditions or construction. For example, it is very clearly shown at column 5, lines 40-55 that the first motor 50R and second motor 52R are necessary to rotate different portions of the robot arm. That is, first motor 50R rotates a forearm spindle 56R and second motor 52R rotates an upper arm spindle 80R. "Coordinated operation of first

Response under 37 C.F.R. § 1.116

Serial No. 09/765,830

Page 6 of 14

and second motors 50R and 52R in conjunction with mechanical linkage...causes hand 30R to rotate about shoulder axis 16R" (column 5, lines 54-57, Bacchi). Additionally, "complicated concurrent linear and angular displacement move profiles of hand 30R could be accomplished by programming controller 54 to operate motors 50R and 52R through different angular displacements" (column 10, lines 6-11, Bacchi). Additionally, column 9, lines 32-44 of Bacchi 2 specifically describe the fact that three motors are needed to carry out straight line motion of the offset hand 30R. Therefore, from the disclosed teachings of either Bacchi or Bacchi 2 it can be concluded that motor 50R will only actuate blade 30R and not also first arm 14R. Similarly, second motor 52R will only actuate arm 14R and not also blade 30R. The same analysis holds true for the left hand assembly. Therefore, neither the specific mounting of Applicant's blade to robot arm structure, nor the extension motor configuration to allow simultaneous extension retraction of the robot arm and blade with a single motor on one side is disclosed. Accordingly, neither of the cited references teach, disclose or suggest the invention of claim 1.

A similar analysis and argument can be provided with respect to the invention claimed in claim 11. That is, neither the seventh or eighth elements of claim 11 are disclosed in cited references. Specifically, Applicant claims a first robot blade hub being rotatably mounted to a distal location of the first robot arm from the first extension hub and a second robot blade hub being rotatably mounted to a distal location of the second robot arm from the second extension hub. This structure is plainly not seen in either Bacchi or Bacchi 2 because, and as disclosed above, the intermediate forearm 22R is mounted to upper arm and then blade 30R is mounted to forearm 22R. Accordingly, the attendant hub of forearm 22R, 32R is not part of upper arm 14R as would be required to read upon the subject claim language and invention. The same analysis, of course, holds true for the

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 7 of 14

second robot blade hub with respect to the left side assembly of either Bacchi or Bacchi 2.

With regards to independent claim 24, it is respectfully submitted that the claimed method steps are not disclosed by either of Bacchi or Bacchi 2. That is, the claimed method includes a step of rotating the main robot link to insert the first robot blade (by simultaneously extending the first extension arm and robot blade). The references clearly do not perform such a step. Specifically, Applicant directs attention to Bacchi, Figs. 10 and 11 whereby wafer transfer sequences are shown in various frames. At no time is the main robot link (i.e., item 11) rotated to perform the claimed insertion step. Bacchi relies solely on the degree of freedom of the intermediate elbow 22 and arm 14 to accomplish its insertion step. Accordingly, the claim is not anticipated by these teachings. As such, the Applicant submits that claims 1, 11 and 24 are not anticipated and fully satisfy the requirements under 35 U.S.C. § 102 and is patentable thereunder. Furthermore, claims 6, 7, 12-14, 19-21 and 25-29 depend, either directly or indirectly, from independent claims 1, 11 and 24 and recite additional features thereof. As such, and for at least the same reasons discussed above, the applicants submit that these dependent claims also fully satisfy the requirements under 35 U.S.C. § 102 and are patentable thereunder. Therefore, the applicants respectfully request that the rejection be withdrawn.

B. 35 U.S.C. § 103

1. Claims 2 and 15

Claims 2 and 15 are rejected under 35 U.S.C. § 103 as being unpatentable over either Bacchi or Bacchi 2 in view of U.S. Patent No. 6,212,968 issued April 10, 2001 to Hiruma et al. (hereinafter Hiruma). Specifically, the Examiner alleged that it would have

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 8 of 14

been obvious to use a stepper motor for each motor in either of the primary references in view of Hiruma's teachings if it was desired to save weight. The rejection is respectfully traversed.

Claims 2 and 15 depend either directly or indirectly upon either independent claim 1 or 11 and recite additional features thereof. It has above been discussed and argued that the teachings and disclosure of either Bacchi or Bacchi 2 are insubstantial in forming the basis of an anticipation rejection. Therefore, any attempt at combination of either Bacchi or Bacchi 2 with an additional reference to attack features of dependent claims will not support a conclusion of obviousness. That is, without the desired robot blade, extension arm and extension motor configurations as described and claimed in the independent claims, any resultant combination of references will still fail to disclose this invention. Accordingly, it is respectfully submitted that the combination of either Bacchi or Bacchi 2 with Hiruma is not obvious with respect to the dependent claims and such claims are patentable under the statute.

2. Claims 5, 8, 9, 10, 18 and 23

Claims 5, 8, 9, 10, 18 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Bacchi or Bacchi 2 in view of U.S. Patent No. 5,746,565 issued May 5, 1998 to Tepolt (hereinafter Tepolt). Specifically, the Examiner indicated that it would have been obvious to use two segment arms instead of three segment arms in either Bacchi or Bacchi 2 as per the teachings of Tepolt. This would allegedly provide a unitary main linkage. The rejection is respectfully traversed.

Claims 5, 8, 9, 10, 18 and 23 are dependent upon either of independent claims 1 or 11 and recite additional features thereof. As described and argued above with respect to these independent claims, the primary references, Bacchi or Bacchi 2, do not provide adequate teaching or disclosure to arrive at the conclusion of

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 9 of 14

anticipation with regard to the subject invention. Therefore, any alleged or attempted combination of these deficient references with an additional reference to show obviousness of the dependent features of the subject invention fails to result in the subject invention. That is, the resultant combination of either Bacchi or Bacchi 2 with Tepolt still fails to show at least a first extension motor configured to provide controllable simultaneous extension or retraction of the first robot extension arm and the first robot blade and a second extension motor similarly configured.

In greater detail, one need only look at Figure 2 noting motors 54 and 58 and the corresponding portion of the written description at column 3, line 15-44 to ascertain the physical interaction and connection of motors and arms of Tepolt. Specifically and most importantly, "A shaft 62 passing through the first encoder 56 and the first motor is connected to a first pulley 64 which is rotated by the second motor 58...rotation of the first pulley 64 causes the second pulley 68 to rotate, thereby rotating the second arm portion 20 with respect to the first arm portion 18. As shown by the dotted lines, each of the arm portions is independently rotatable through 360 degrees in both clockwise and counter-clockwise directions." As per this section of Tepolt, it is easily understood and seen that arms 18 and 20 are independently controllable of each other. Thus, there is absolutely no need, desire or suggestion of configuring either of the motors 54 or 58 in the manner claimed and described in the subject invention. That is, Applicant's claims recite one extension motor on either side of a main robot link that is configured to provide controllable simultaneous extention or retraction of the robot arm and attendant blade mounted thereto. Since Tepolt shows two motors requiring motion of the blade, it is absolutely impossible for Tepolt to suggest configuring either of the motors in the manner claimed in the subject invention. Such construction is simply not contemplated in Tepolt. Accordingly,

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 10 of 14

it is respectfully submitted that the resultant combination still fails to adequately teach, describe or suggest the subject invention. Accordingly, these dependent claims are not obvious with respect to the combined teachings of Bacchi, Bacchi 2 and Tepolt and are patentable under the statute.

Of special consideration and note, Applicant addresses Examiner's comments to his Section 8 of the Final Office Action. Specifically, the Examiner indicated that motors 50R and 50L of either Bacchi or Bacchi 2 extend and retract their respective arms. While this may be true, the Examiner has clearly not shown that either of these motors can extend and retract the arm and the blade. That is, if only one motor of Bacchi or Bacchi 2 is activated, the blade will still not move into proper orientation for complete insertion in a process cell or chamber or adequate retraction to clear a slit valve of such process chamber. Additionally, it may also be considered that should only one motor be activated out of the two required in Bacchi or Bacchi 2, the end effector may slide, scratch, damage or otherwise come into contact with the walls of the transport area in which the robot link operates; neither of which is a desirable condition.

The Examiner then offers that motors 52R and 52L can be used to provide additional operation but Applicant's claims do not preclude these additional motors. In response, it is respectfully submitted that such additional motors are not required or contemplated or in the least desirable in subject invention and it is specifically for this reason that they are not part of the subject invention. That is, Applicant's first and second extension motors are capable of completing the same functions as the combined effects of motors 50R and 52R or 50L and 52L. Once again, it is respectfully submitted that either of the first two motors 50R or 50L of Bacchi or Bacchi 2 cannot simultaneously act upon its respective extension arm and the robot blade in the manner desired (i.e., to extend and retract these components so

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 11 of 14

that the invention operates in the manner expected). That is, one can possibly only operate one of the right or left side motors of Bacchi or Bacchi 2 in the hopes of adequately retracting or extending the robot blade arm, but since additional motors were part of the design, such actions would most likely not be attempted since the desired range of motion could not be adequately controlled; thus, the second motor is added.

Conclusion

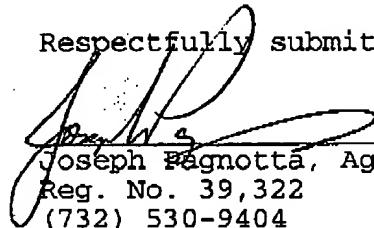
The Applicant submits that all of these claims now pending in the application fully satisfy all requirements of 35 U.S.C. §§ 112, 102 and 103. Consequently, the applicant believe that all these claims are presently in condition for allowance.

Accordingly, the Applicant now requests that this amendment be entered under the provisions of 37 C.F.R. § 1.116 and earnestly solicit reconsideration of this application and its swift passage to issue.

If, however, the Examiner believes that any unresolved issues still exist in any of these claims that require a continuance of the adverse final action therefor, it is requested that the Examiner telephone Mr. Joseph Pagnotta at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

November 20, 2002

  
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Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 12 of 14

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Type or print name of person signing certification  
Kathleen Faughnan  
Signature

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 13 of 14

APPENDIX  
MARKED-UP CLAIMS

5. (Amended) The robot apparatus of claim 1, wherein the main robot [linkage] link is a unitary structure.

11. (Amended) A robot apparatus to be mounted on a robot hub, the robot apparatus comprising:

a main robot link fixedly mounted to rotate about the robot hub;

a hub motor capable of providing controllable rotational motion to the main robot link about the robot hub;

a first extension hub being rotatably mounted to a first side of the main robot link;

a second extension hub being rotatably mounted to a second side of the main robot link, the second side being on an opposed side of the robot link from the first side;

a first extension arm being mounted to the first extension hub;

a second extension arm being mounted to the [first] second extension hub;

a first robot blade hub being rotatably mounted to a distal location of the first robot arm from the first extension hub;

a second robot blade hub being rotatably mounted to a distal location of the second robot arm from the second extension hub;

a first robot blade mounted to the first robot blade hub;

a second robot blade mounted to the second robot blade hub;

a first extension motor configured to provide a first controllable simultaneous extension or a first controllable simultaneous retraction of the first extension arm about the first extension hub and the first robot [blades] blade about the first robot blade hub; and

Response under 37 C.F.R. § 1.116  
Serial No. 09/765,830  
Page 14 of 14

a second extension motor configured to provide a second controllable simultaneous extension or a second controllable simultaneous retraction of the second extension arm about the second extension hub and the second robot [blades] blade about the second robot blade hub.

18. (Amended) The robot apparatus of claim 11, wherein the main robot [linkage] link is a unitary structure.